



Requirements of the Undergraduate Economics Major: An Update & Comparison

Emily C. Marshall, Anthony Underwood, and Abigail Hyde

Dickinson College

ASSA 2023

January 6, 2023: Session A2

Background

Since Siegfried (1991), there has been some consensus on the *broad* requirements of the economics major:

- **foundational** requirements: principles; intermediate; quantitative methods
- **breadth** requirements: topical electives
- **depth** requirements: upper-level electives
- **capstone** requirements: application through research and writing

Background

Several survey-based assessments have documented this consensus

- Bosshardt, Watts, and Becker (2013)
- McGoldrick (2008)
- Siegfried and Bidani (1992)
- Siegfried and Walstad (2014)

To our knowledge, only one comprehensive description of major requirements has been published based on the discipline in 2010

- Petkus, Perry, and Johnson (2014)
- Johnson, Perry, Petkus (2012)

Motivation

1. The discipline has continued to evolve since 2010 becoming more empirical (Angrist et al. 2017; Hamermesh 2013).
2. The economics degree titled "Econometrics and Quantitative Economics" (by NCES) has increased in popularity, from 1% of all economics degrees conferred in 2012 to 36% in 2021 (Marshall and Underwood 2020; 2022).
3. Previous work did not specify the requirements of the "typical" economics major - we do so through weighting by degrees conferred.

More Background: CIP Codes

Some economics departments have been either:

1. **reclassifying their major** (from “Economics, General”) or
2. **adding an additional major**

listed as some version of “Econometrics and Quantitative Economics”

CIP Code	Title
45.0601	Economics, General.
45.0602	Applied Economics.
45.0603	Econometrics and Quantitative Economics.
45.0604	Development Economics and International Development.
45.0605	International Economics.
45.0699	Economics, Other.
1.0103	Agricultural Economics.
3.0204	Natural Resource Economics.

More Background: CIP Codes

The definition of the “**Economics, General**” major is:

A general program that focuses on the systematic study of the **production**, conservation and allocation of resources in conditions of **scarcity**, together with the **organizational frameworks** related to these processes. Includes instruction in economic theory, micro- and macroeconomics, comparative economic systems, money and banking systems, international economics, quantitative analytical methods, and applications to specific industries and public policy issues.

The definition of “**Econometrics and Quantitative Economics**” is:

A program that focuses on the systematic study of **mathematical** and **statistical analysis** of economic phenomena and problems. Includes instruction in economic statistics, optimization theory, cost/benefit analysis, price theory, economic modeling, and economic forecasting and evaluation.

CIP Code Implications

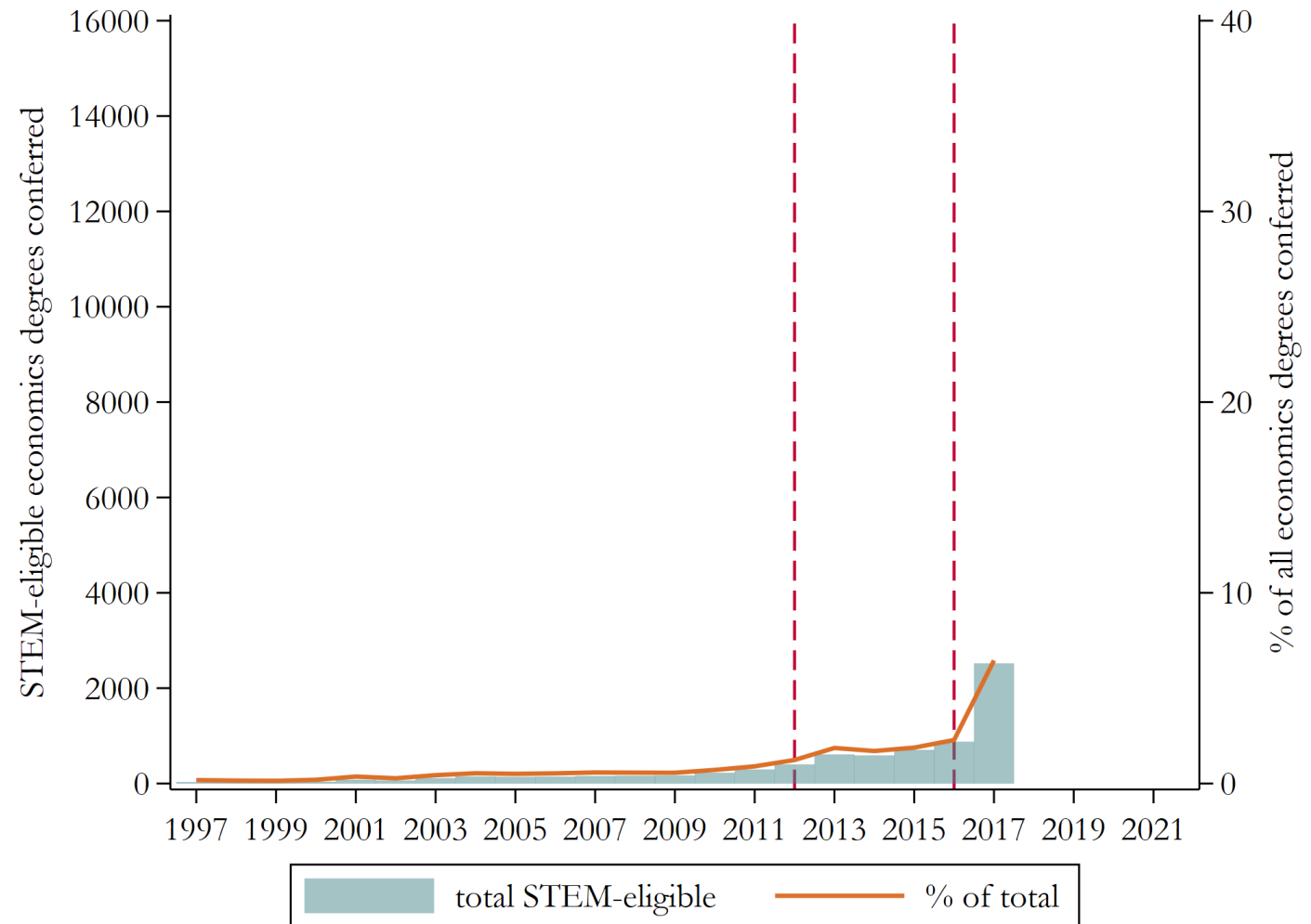
In 2012, the US Department of Homeland Security announced an expanded list of STEM-designated degree programs to include “Econometrics and Quantitative Economics” among others...

- Since 2008, international students with a STEM degree are eligible for an optional 17-month practical training (OPT) extension (29 months total)
- In 2016, the policy was updated to allow graduates a 24-month STEM-OPT extension (or 36 months total)

Trends in the Discipline STEM (Re-)Classification

In late-2018, based on **2017 IPEDS completions data**, we first saw this...

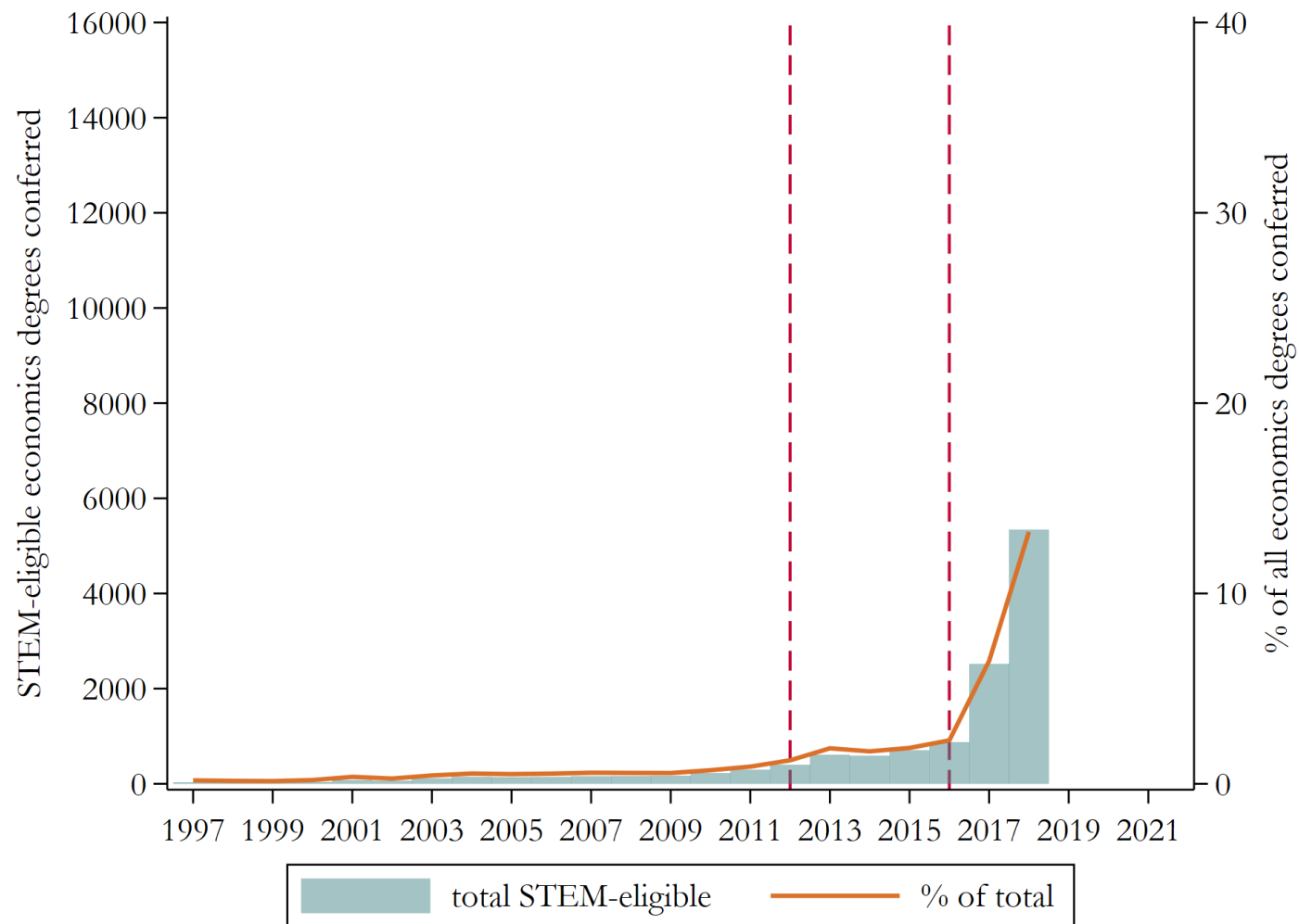
- **47 institutions**
- **6.5%** of economics degrees conferred



Trends in the Discipline STEM (Re-)Classification

In late-2019, based on **2018 IPEDS completions data**, we saw this...

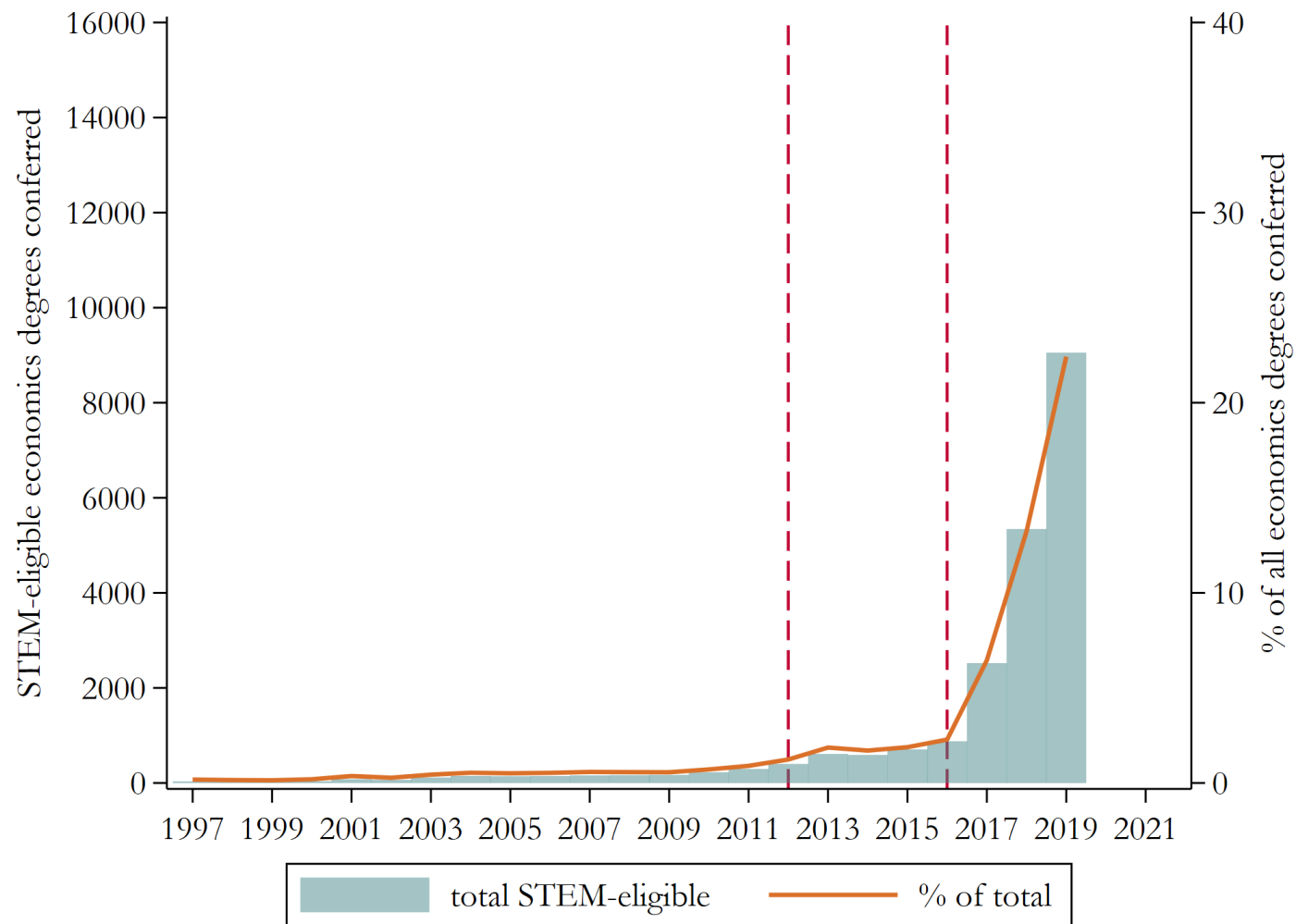
- **71 institutions**
- **13.2%** of economics degrees conferred



Trends in the Discipline STEM (Re-)Classification

In late-2020, based on **2019 IPEDS completions data**, we saw this...

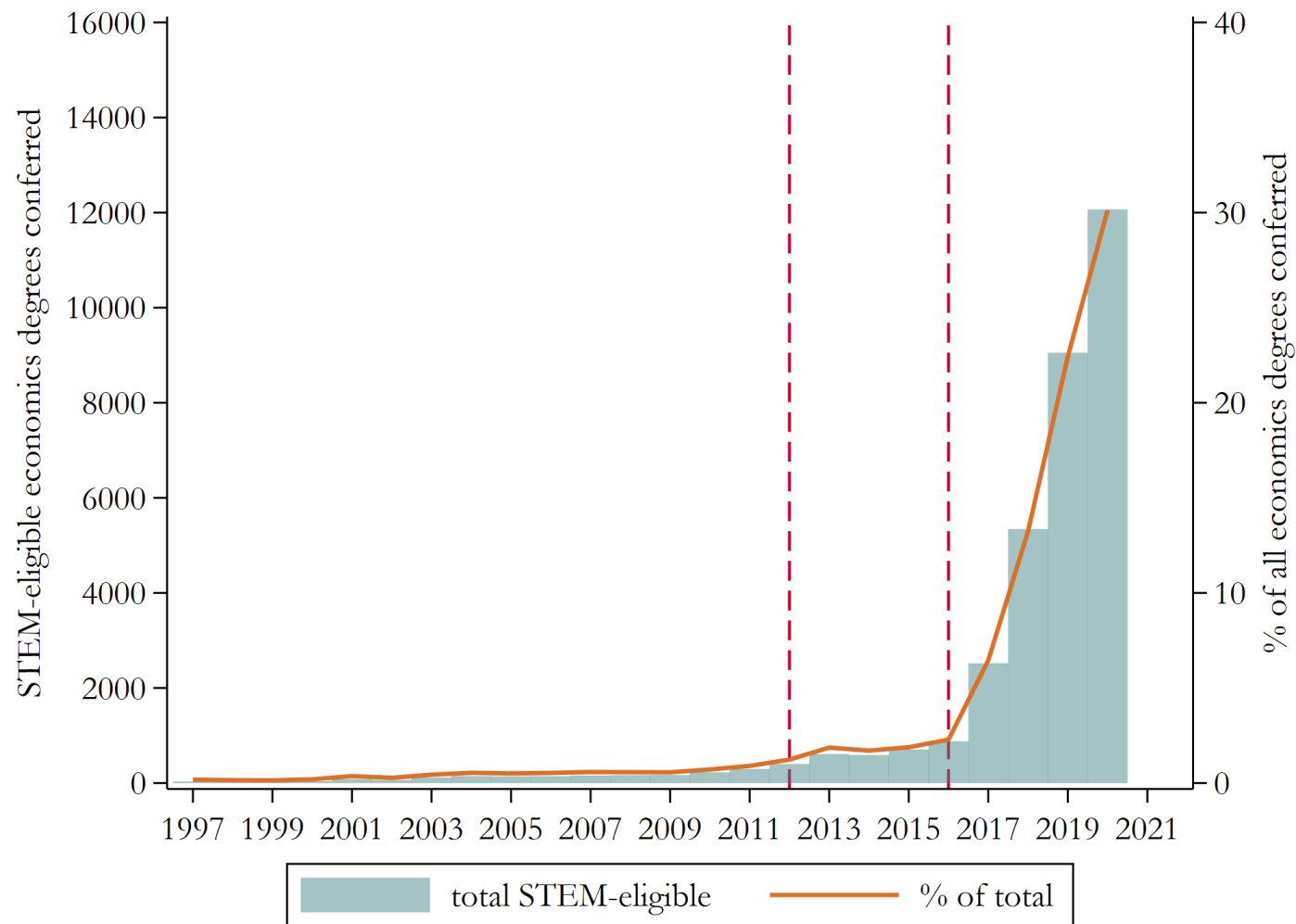
- **97 institutions**
- **22.4%** of economics degrees conferred



Trends in the Discipline STEM (Re-)Classification

In late-2021, based on **2020 IPEDS completions data**, we saw this...

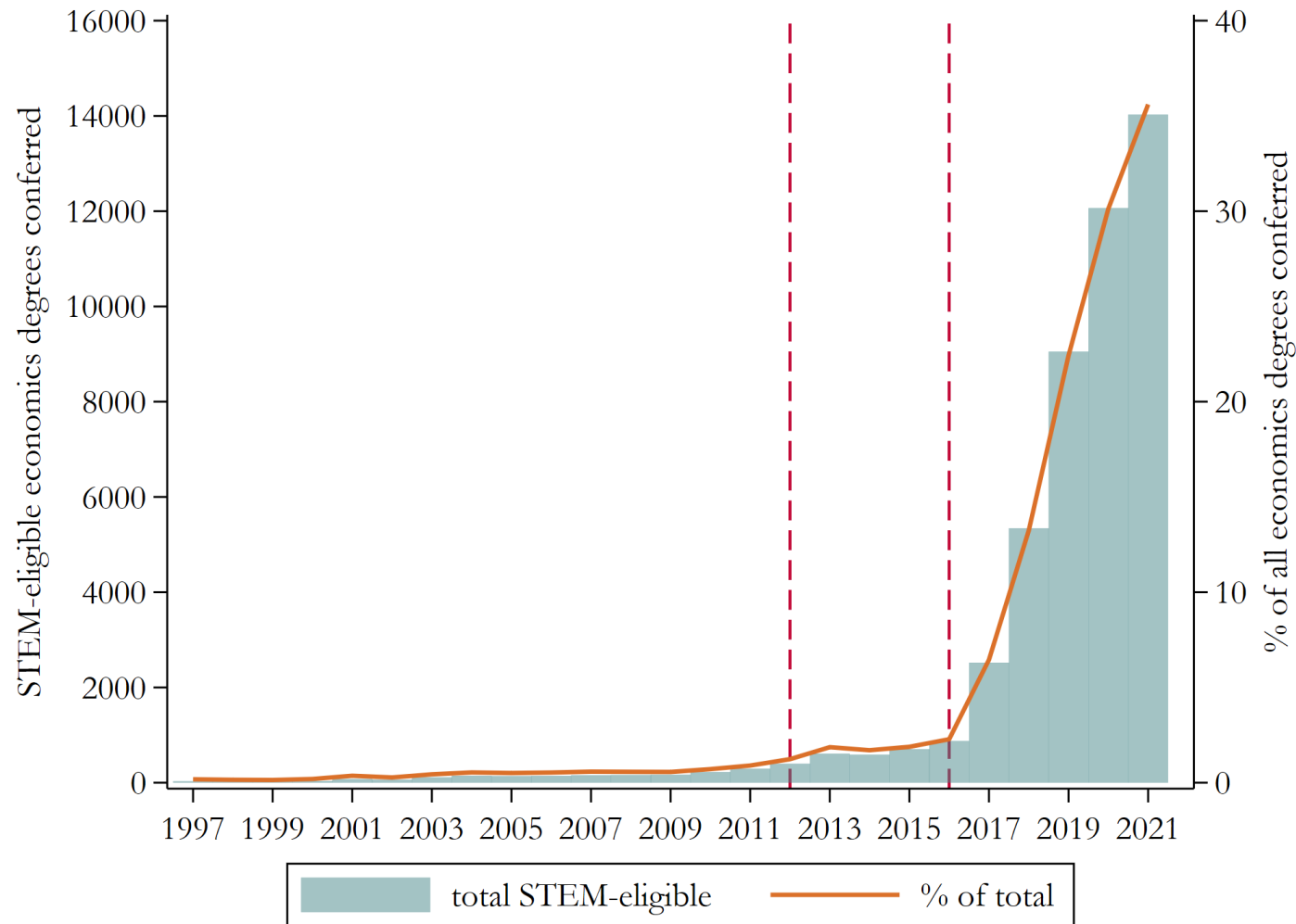
- **121 institutions**
- **30.1%** of economics degrees conferred



Trends in the Discipline STEM (Re-)Classification

In late-2022, based on **2021 IPEDS completions data**, we saw this...

- **138 institutions**
- **35.6%** of economics degrees conferred



Data & Methods

- Begin with 2019 IPEDS completions by degree type (CIP): all degrees conferred in the US from July 1, 2018, to June 30, 2019
- Restrict to the undergraduate level only
- Define economics as:

CIP Code	Title
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1.0103	Agricultural Economics.
3.0204	Natural Resource Economics.

this yields a list of **1,020 degrees** (from 793 institutions)

Data & Methods

- During the summer and fall of 2020 we cataloged requirements from department websites and college/university bulletins.
 - **1,178 degrees** from the 793 institutions
 - of these, we were unable to determine some (or all) requirements
 - Sample of **956 degrees** (from 662 institutions)
 - of these, we were unable to match many to the appropriate CIP code
 - *Full information* sample of **801 degrees** (from 653 institutions)

Data & Methods

CIP Code	Title	(1)	(2)	(3)	(4)
		Degree Types Conferred (IPEDS 2019)	% of Degree Types Conferred	Degree Types Cataloged	% of Degree Types Cataloged
45.0601	Economics, General	745	71.2%	617	74.5%
45.0602	Applied Economics	24	0.79%	16	0.73%
45.0603	Econometrics and Quantitative Economics	104	21.5%	86	20.5%
45.0604	Development Economics & International Development	30	0.82%	14	0.28%
45.0605	International Economics	30	0.81%	19	0.43%
45.0699	Economics, Other	44	0.92%	28	0.29%
1.0103	Agricultural Economics	34	3.8%	23	3.1%
3.0204	Natural Resource Economics	9	0.20%	6	0.20%
<i>Total</i>		1,020	100%	801	100%

Notes: Columns (1) and (2) are based on 2019 IPEDS completions data while columns (3) and (4) are based on the requirements of 801 degrees conferred by 653 unique institutions with complete requirements, CIP code, and classification information.

Core Requirements (Historical Comparison)

Course	Percentage of Degrees Requiring N = 964	Petkus, Perry, Johnson (2014) N = 1601	Bosshardt, Watts, & Becker (2013) N = 160; N = 77	Siegfried & Walstad (2014) N = 283
principles of economics	99.3%	99.9%	-	80%
combined principles (1 semester)	13.8%	12.3%	21%; 16%	19%
separate principles (2 semesters)	85.6%	85.1%	83%; 88%	-
principles in any order	77.8%	69.0%	-	-
micro before macro	10.4%	23.0%	-	-
macro before micro	2.4%	8.1%	-	-
intermediate micro and macro	95.1%	94.8%; 94.1%	99%; 99%	99%
intermediate with calculus	63.3%	-	-	-
math and econometrics				
single-variable calculus	69.0%	64.8%	-	74%
statistics	92.1%	93.9%	79%; 66%	74%
basic econometrics	54.2%	40.7%	41%; 56%	50%

Notes: Based on the requirements of 964 degrees conferred by 662 unique institutions.

Complete Requirements (Historical Comparison)

Course	Percentage of Degrees Requiring	Petkus, Perry, Johnson (2014)	Bosshardt, Watts, & Becker (2013)	Siegfried & Walstad (2014)
	N = 956	N = 1601	N = 160; N = 77	N = 283
principles of economics	99.3%	99.9%	-	-
intermediate micro and macro	95.2%	94.8% / 94.1%	99%; 99%	99%
intermediate with calculus	63.2%	-	-	-
single-variable calculus	69.0%	64.8%	-	74%
multi-variable calculus	11.8%	-	-	-
statistics	92.0%	93.9%	79%; 66%	74%
basic econometrics	54.3%	40.7%	41%; 56%	50%
advanced econometrics	2.5%	-	-	-
money and banking	19.0%	-	14%; 25%	10%
political economy	15.5%	-	-	-
history of economic thought	11.3%	-	15%; 16%	11%
senior capstone	44.4%	-	33%; 29%	49%

Notes: Based on the requirements of 956 degrees conferred by 662 unique institutions.

Requirements by Institution Type

Course	Total	Universities (PhD)	Masters	Liberal Arts	Baccalaureate
	N = 956	N = 429	N = 288	N = 209	N = 30
principles of economics	99.3%	98.8%	99.7%	99.5%	100.0%
intermediate micro and macro	95.2%	95.7%	95.0%	96.7%	80.0%
intermediate with calculus	63.2%	71.1%	45.8%	73.9%	43.3%
single-variable calculus	69.0%	76.5%	53.3%	78.0%	50.0%
multi-variable calculus	11.8%	16.9%	4.9%	11.5%	6.7%
statistics	92.0%	92.9%	92.9%	90.2%	83.3%
basic econometrics	54.3%	57.5%	49.0%	56.9%	43.3%
advanced econometrics	2.5%	3.5%	1.7%	1.9%	0.0%
money and banking	19.0%	15.2%	27.1%	11.7%	46.7%
political economy	15.5%	11.1%	18.8%	17.0%	36.7%
history of economic thought	11.3%	6.6%	16.7%	11.0%	30.0%
senior capstone	44.4%	31.0%	48.8%	63.9%	56.7%
number of institutions	656	267	215	148	26
% of degrees conferred (2019)	100%	75.1%	11.3%	13.1%	0.4%

Notes: Based on the requirements of 956 degrees conferred by 656 unique institutions with complete requirements and classification information.

“Typical” Requirements by STEM Designation

CIP Code	Title
45.0601	Economics, General.
45.0602	Applied Economics.
45.0603	Econometrics and Quantitative Economics.
45.0604	Development Economics and International Development.
45.0605	International Economics.
45.0699	Economics, Other.
1.0103	Agricultural Economics.
3.0204	Natural Resource Economics.

STEM

non-STEM

“Typical” Requirements by STEM Designation

Course	Total		STEM		non-STEM	
	N = 801		N = 86		N = 715	
	(1) <i>unweighted</i>	(2) <i>weighted</i>	(3) <i>unweighted</i>	(4) <i>weighted</i>	(5) <i>unweighted</i>	(6) <i>weighted</i>
principles of economics	99.4%	99.6%	100.0%	100.0%	99.3%	99.5%
intermediate micro and macro	95.7%	98.5%	100.0%	100.0%	95.5%	98.1%
intermediate with calculus	62.6%	77.9%	93.0%	94.3%	58.7%	73.7%
single-variable calculus	67.1%	81.8%	93.0%	94.3%	63.7%	78.6%
multi-variable calculus	9.5%	14.2%	50.0%	51.5%	4.7%	4.6%
statistics	92.5%	97.0%	95.9%	97.0%	92.0%	96.9%
basic econometrics	54.2%	62.7%	85.5%	88.4%	50.3%	56.1%
advanced econometrics	2.5%	3.2%	11.6%	7.9%	1.4%	2.0%
money and banking	17.1%	8.4%	7.0%	14.5%	18.1%	6.8%
political economy	13.7%	5.7%	4.7%	1.7%	14.7%	6.7%
history of economic thought	11.9%	4.6%	3.5%	0.6%	13.1%	5.6%
senior capstone	43.3%	22.5%	45.9%	20.8%	43.4%	23.0%
number of institutions	656		85		617	
% of degrees conferred (2019)	100%		20.5%		79.5%	

Notes: Based on the requirements of 801 degrees conferred by 656 unique institutions with complete requirements, CIP code, degrees conferred, and classification information.

Conclusions

- The discipline continues to become more empirical with **econometrics requirements** continuing to **increase** in prevalence.
- **Differences in requirements by institution type** persist, especially in terms of quantitative rigor.
- The weighted requirements suggest that, of economics majors,
 - **82%** are required to take **single-variable calculus**,
 - **78%** are required to take **calculus-based intermediate courses**, and
 - **63%** are required to take **econometrics**
 - only **5%** are required to take **history of thought**.

Final Thoughts

- Differences in requirements by STEM designation are clear, but “how much” quantitative rigor is “enough” to warrant STEM designation remains unclear.
- Broader implications of these differences across major types, in terms of diversity in the discipline and potential heterogeneous labor market outcomes warrant further research.

THANK YOU! QUESTIONS??